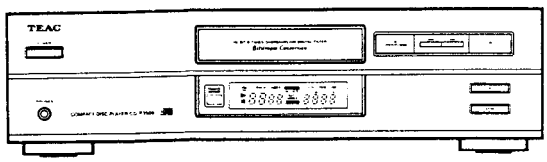
TEAC®



SERVICE MANUAL

CD-P3500

Compact Disc Player

COMPACT disc DIGITAL AUDIO

Effective : September, 1992

5704062100

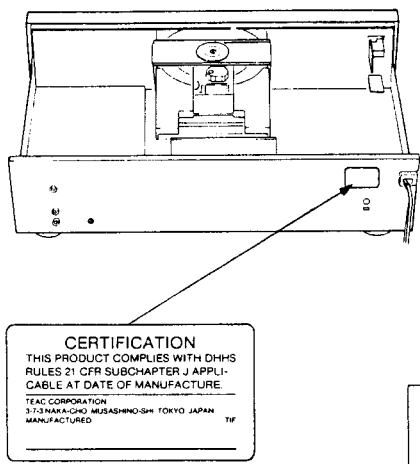
1 SAFETY INFORMATION

SAFETY INFORMATION

This product has been designed and manufactured according to FDA regulations "title 21, CFR, chapter 1, subchapter J, based on the Radiation Control for Health and Safety Act of 1968", and is classified as class 1 laser product. There is not hazardous invisible laser radiation during operation because invisible laser radiation emitted inside of this product is completely confined in the protective housings.
The label required in this regulation is shown ① .

CAUTION

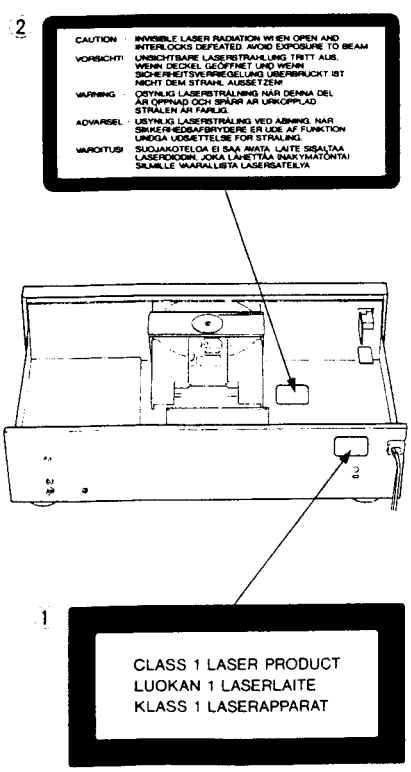
- If you remove the above-mentioned housings under the operating state of the product, there is a possibility of human access to the invisible laser radiation emitted from the optical pickup.
  Pay careful attention, not to let the invisible laser beam enter into your eyes.
- If you find a troubled state of the laser diode, change to the specified new optical pickup.
- If you find a troubled state of safety interlock parts, change to the same type parts described in parts list.


①
CERTIFICATION
THIS PRODUCT COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE.
TEAC CORPORATION
3-7-3 NAKA-CHO MUSASHINO-SHI TOKYO JAPAN
MANUFACTURED

For U.S.A.

Optical pickup: Type : KSS-150A/KSS-210A
Manufacturer : SONY Corporation
Laser output : Less than 0.4 mW on the objective lens
Wavelength : 760 ~ 800 nm

• CAUTION • ACHTUNG • OBSERVERA • ADVARSEL



① THIS LABEL IS ATTACHED TO THE PLACE AS ILLUSTRATED TO INFORM THAT THE APPARATUS CONTAINS A LASER COMPONENT.

① DIESE AUFKLEBEMARKE IST AN DEM IN DER ABBILDUNG GEZEIGTEN ORT ANGEBRACHT UM DARAUF HINZUWEISEN, DASS IM INNERN DES GERÄTS EINE LASER-KOMPONENTE BEFINDET.

① PÅSKRIFTEN SITTER PÅ APPARATEN SOM VISAS SOM UPPMANING OM ATT APPARATEN OMFATTAR EN INBYGGD LASERKOMPONENT.

① DETTE MÆRKAT ER ANBRAGT SOM VIST I ILLUSTRATIONEN FOR AT ADVARE BRUGEREN OM AT APPARATET INDEHOLDER EN LASERKOMPONENT.

② DETTE MÆRKAT ER SOM VIST PÅ ILLUSTRATIONEN ANBRAGT PÅ INDERSIDEN AF TOPDÆKSLET FOR AT ADVARE BRUGEREN OM AT YDERLIGERE FREMTRÆNGEN VIL VÆRE FORBUNDET MED FARE FOR AT UDSÆTTE SIG FOR LASERSTRÅLING.

ADVARSEL – BETJENING AF ANDRE KONTROLLER OG REGULATORER ELLER BENYTTELSE AF ANDRE FREMGANGSMÅDER END BESKREVET HERI ER FORBUNDET MED FARE FOR UDSÆTTELSE FOR LASERSTRÅLING.

VARNIG: APPARATEN INNEHÅLLER LASER KOMPONENT MED STRÅLNING ÖVERSTIGANDE KLASS 1

"ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING NAR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING"

"VAROITUS! SUOJAKOTELOA EI SAA AVATA. LAITE SISÄLTÄÄ LASERDIODIN. JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ".

2 SPECIFICATIONS

AUDIO

Number of Channels	2
Frequency Response	1 – 20,000Hz ± 0.5dB
Signal to Noise Ratio	Better than 104dB (1kHz)
Dynamic Range	Better than 98dB (1kHz)
Harmonic Distortion	0.0022% (1kHz)
Wow and Flutter	Unmeasurable (Quartz accuracy)
Channel Separation	Better than 102dB (1kHz)
Output Analog	1.7Vrms
Digital	0.5Vp-p/75Ω (Coaxial)
Headphones	20mW/33Ω
D/A Converter	Bitstream conversion
Digital Filter	8-times oversampling 20-bit digital filter
Analog Filter	3rd order Butterworth filter

SIGNAL FORMAT

Error Correction	CIRC (Cross Interleave Reed Solomon Code)
Sampling Frequency	44.1kHz
Quantization bit	16-bit linear/channel
Channel Modulation Code	EFM (Eight to Fourteen Modulation)
Channel Bit Rate	4.3218Mb/sec

PICK UP

Type	Optical 3-Beam laser pickup
Objective Lens	2-dimensional parallel drive
Laser Type	GaAlAs type semiconductor laser
Wave Length	780nm

GENERAL

Power Requirements	120/230/240V AC, 50-60Hz (General Export Model) 120V AC, 60Hz (U.S.A./Canada Model) 230V AC, 50Hz (Europe Model) 240V AC, 50Hz (U.K./Australia Model)
Power Consumption	12 watts
Dimensions (W × H × D)	435 × 119 × 275mm (17-1/8" × 4-11/16" × 10-13/16")
Weight (net)	4.3kg (9.5 lbs)
Standard Accessories	Wireless Remote Control Unit (RC-373), RCA pin-plug cord, Battery (SUM-4, "AAA", "R03" type) × 2

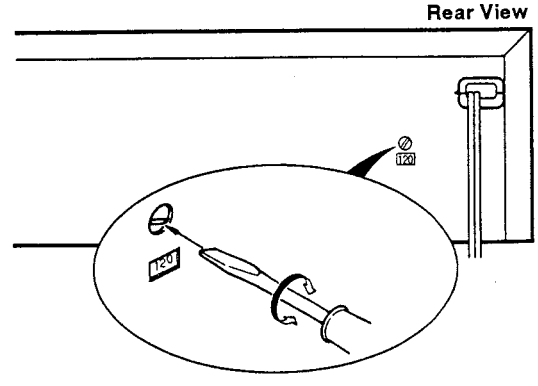
● Improvements may result in specification or feature changes without notice.

VOLTAGE CONVERSION

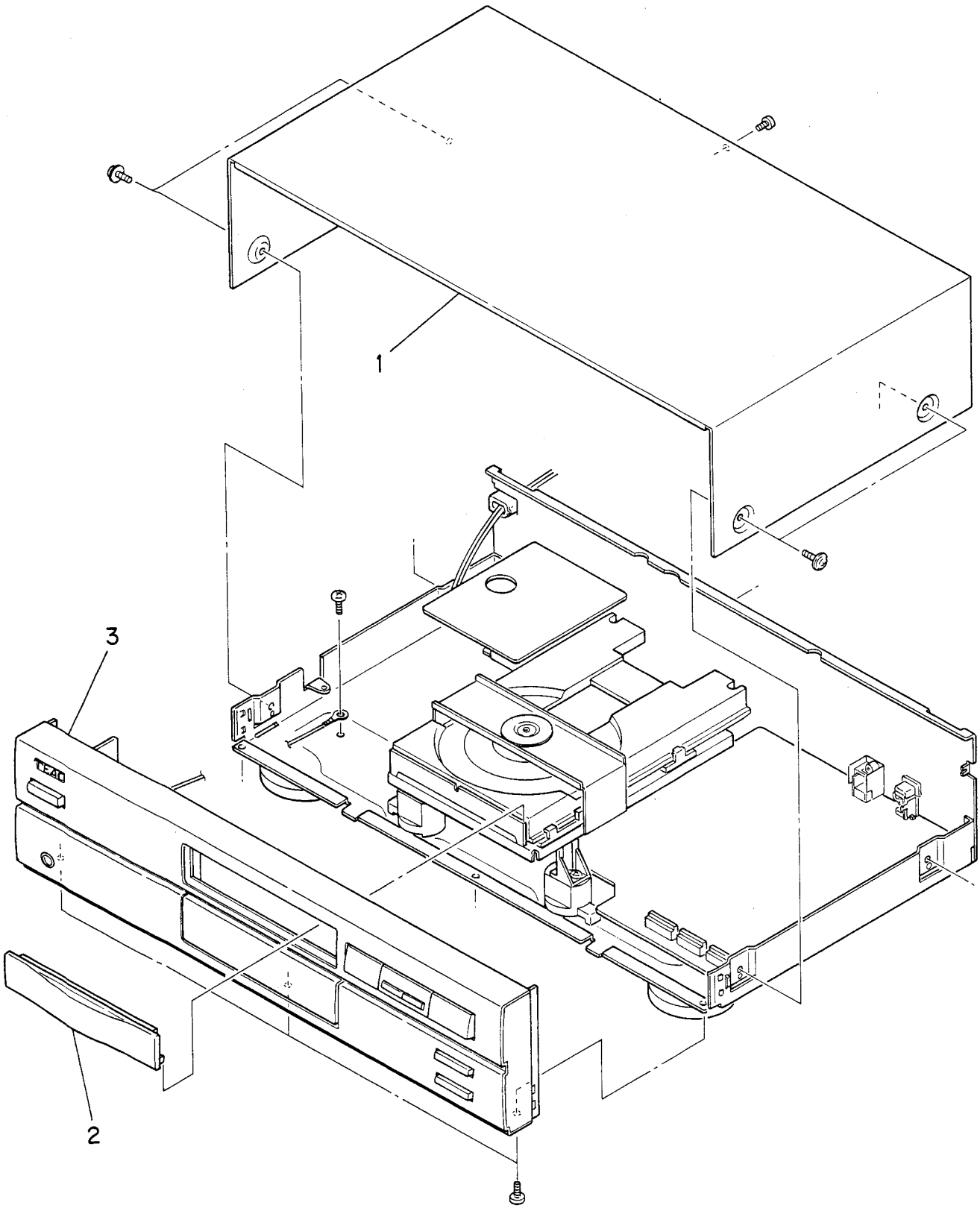
(For general export models)

If it is necessary to change the voltage requirements of the player to match your area, use the following procedure :

1. DISCONNECT POWER LINE CORD.
2. Using a screwdriver, turn the selector until the desired voltage marking appears.



3 CASE AND FRONT PANEL REMOVAL



4 ADJUSTMENT AND CHECKS

1. Replacement of the pickup assembly

- Before removing the pickup assembly be sure to solder -bridge where indicated in the inset (Fig. 4-1) to prevent the laser diode from being electrostatically damaged. After replacing the pickup assembly, be sure to unsolder the antistatic bridge. Or else the laser diode does not function.
- Before servicing the pickup assembly be sure to prevent electrostatic-inducer destruction by grounding not only test equipment in use but also yourself as shown in Fig. 4-2.
  * Electrostatic charge drastically shortens the operating life of the laser diode or possibly results in its destruction.
- During the transportation, mounting and dismounting of the assembly, support with your fingers at points A and B as shown in Fig. 4-3. Be particularly careful not to touch the actuator, photosensor and LD plate and do not apply force to them.
- Soldering must be done quickly at less than 30W, 320℃.
- Don't disassemble the pickup ass'y.
- Don't apply shock to the pickup ass'y.
- Don't place the assembly in a place subject to excessive dust, heat or moisture.

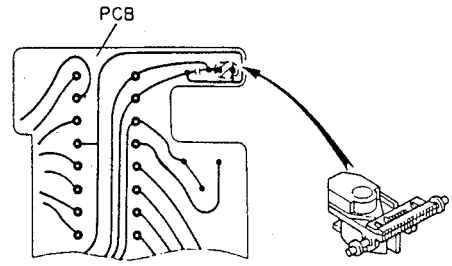


Fig. 4-1

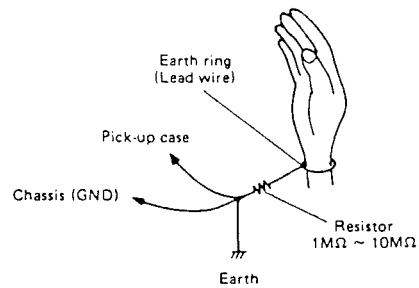


Fig. 4-2

2. Objective

- Laser beams are similar to infrared rays. Don't look at the beams directly and keep your eyes at least 30cm away from them.
- Don't touch the objective with fingers.
- If objective becomes dirty, playback will deteriorate. To clean the objective, moisten a good cleaning tissue, such as made by KODAK, in isopropyl alcohol and wipe the objective gently. Wipe off and excess fluid with a dry cleaning tissue.

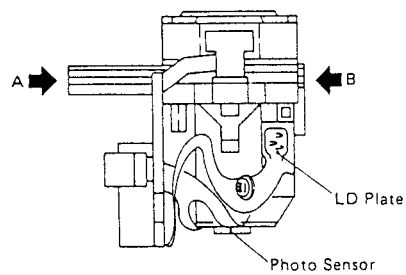


Fig. 4-3

3. Laser diode check

Measure the DC voltage while playing a disc to check that the measured value does not exceed the Iop value indicated on the pickup by **5mA**.[I=measured value/22Ω] If the measured value is higher than that indicated, the pickup may be damaged.

* Pay special attention that parts are not damaged by static electricity.

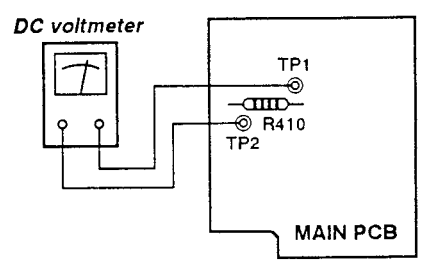
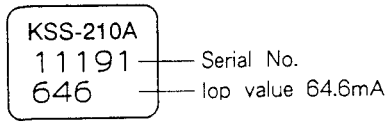


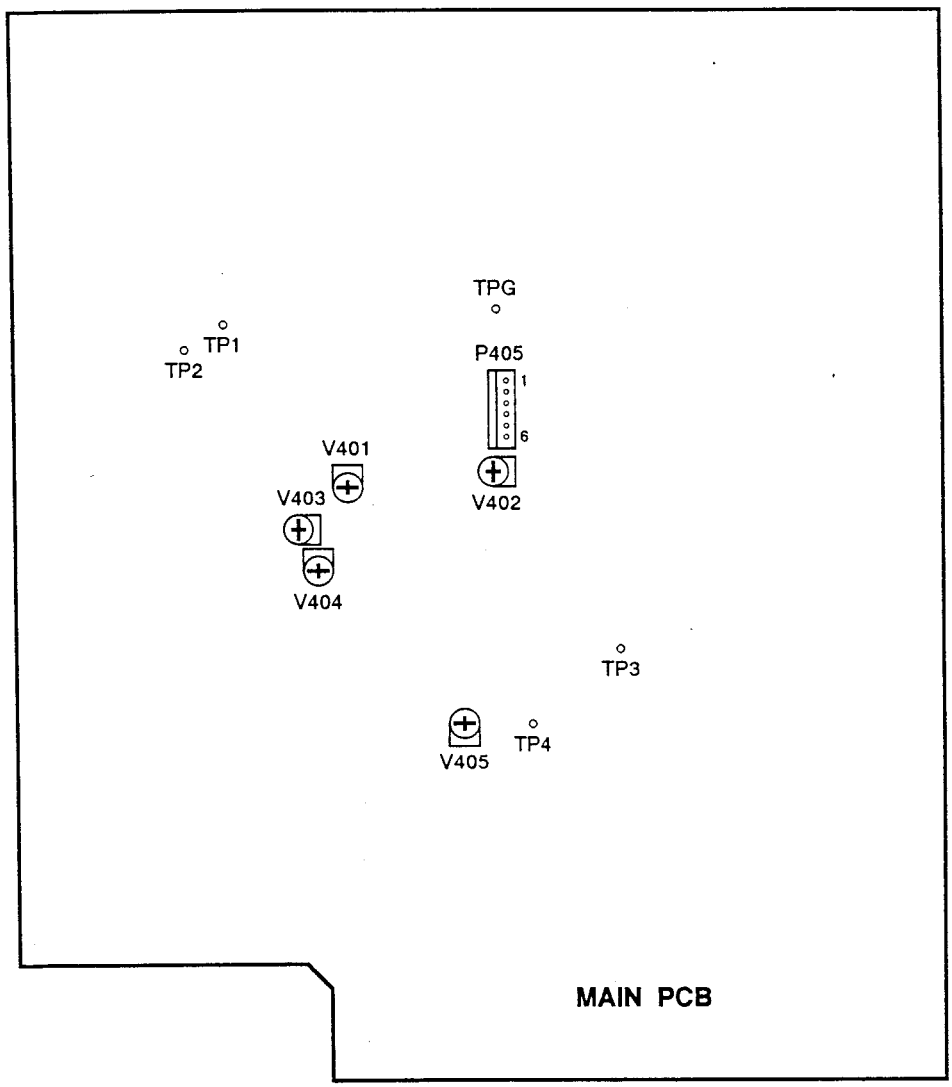
Fig. 4-4

- How to read numbers on sticker attached to the pickup

(Example)



4-1 SERVO ADJUSTMENT



V401	Tracking balance
V402	Focus offset
V403	Focus gain
V404	Tracking gain
V405	PLL frequency

Fig. 4-5

4-1-1 Checking the pickup actuator operation

Before loading the disc, turn the power ON and check that the pickup actuator moves up and down three times. (If the pickup is not at inside on the disc, perform the above operation after moving the pickup to the inside.)

4-1-2 Adjusting the PLL frequency

1. With the tray open, connect the frequency counter in between **TP-3** and **TP-G**, and short circuit between **TP-4** and **TP-G**.
2. Adjust **V405 (PLL)** so that the PLL frequency is **4.3218MHz ± 0.05MHz** at the stop mode.
   For this, use a × 10 sync probe with the frequency counter.

4-1-3 Tracking balance adjustment

1. Connect the oscilloscope between **P405-1 (TE)** and **P405-6 (G)**, and press the SEARCH ◀◀ or ▶▶ button.
2. Adjust **V401** so that the upper and lower amplitudes of the tracking error signal waveform become equal above and below 0V.

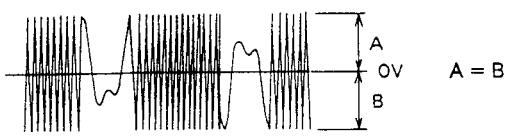


Fig. 4-6

4-1-4 Focus offset adjustment

1. Connect the oscilloscope between **P405-5 (RF)** and **P405-6 (G)**.
2. Play the track 1 of the YEDS-18, and adjust **V402** so that the waveform on the oscilloscope becomes maximum.
3. After adjusting the focus offset, stop the player. Check for an offset voltage of **50mV or less** at **V403 center lead**. If reading values are out of spec, adjust **V402** again.

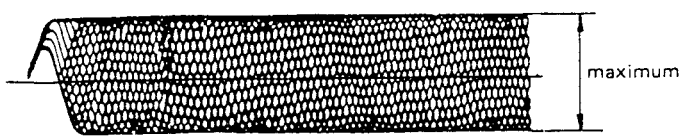


Fig. 4-7

4-1-5 Focus gain adjustment

1. Apply **1.2kHz/200mVp-p** to **P405-4** from an external OSC via 4.7k Ω resistor.
2. Play the track 4 of the YEDS-18, and adjust **V403 (F.G)** so that output levels at **P405-4** and **P405-3** are equal.

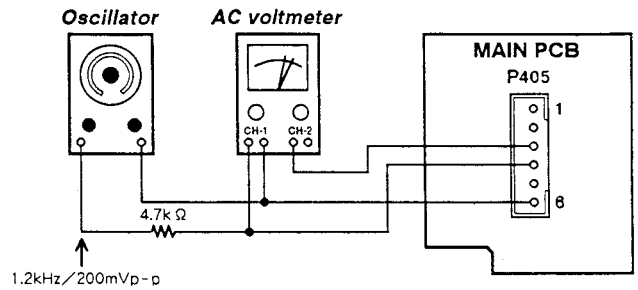


Fig. 4-8

4-1-6 Tracking gain adjustment

1. Apply **1.2kHz/200mVp-p** to **P405-2** from an external OSC via 4.7k Ω resistor.
2. Play the track 4 of the YEDS-18, and adjust **V404 (T.G)** so that output levels at **P405-2** and **P405-1** are equal.

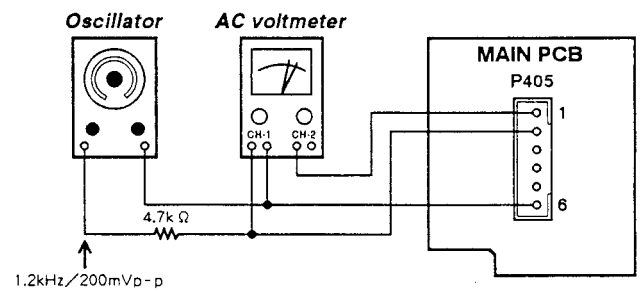


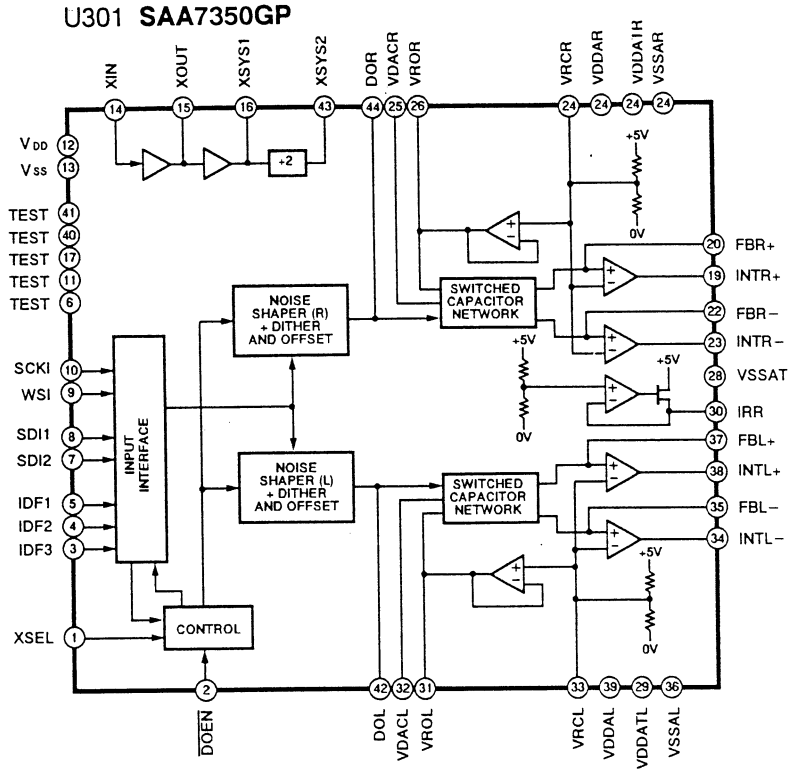
Fig. 4-9

4-2 ELECTRICAL CHARACTERISTICS

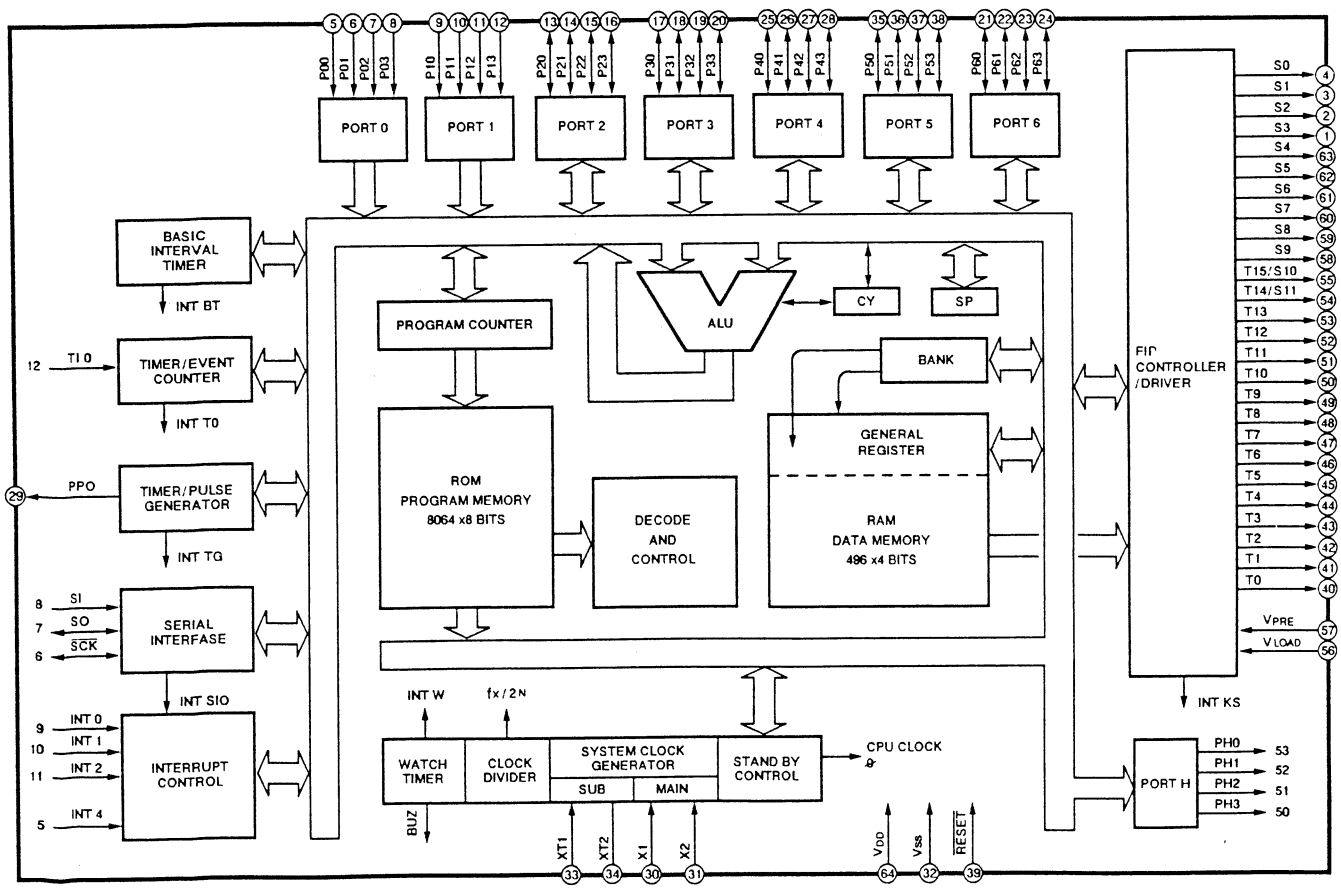
ITEM	DISC: YEDS-18 (YEDS-7)		SPECIFICATIONS	REMARKS
	TRACK No.	FREQUENCY		
1. Output level	2 (1)	1kHz	1.7 ± 0.5Vrms	
2. Channel level difference	2 (1)	1kHz	1.0dB or less	
3. Phones level	2 (1)	1kHz	0.8 ± 0.3Vrms	33 Ω load
4. Harmonic distortion	2 (1)	1kHz	0.009% or less	400Hz~20kHz filter in
5. Frequency response	3~6 (2~13)	20Hz~20kHz	Within ± 1.0dB	reference level: 1kHz
6. S/N ratio	7 (23)		92dB or better	DIN AUDIO (Use SHIBASOKU 725 or equivalent)
7. Channel separation	8, 10 (30, 34)	1kHz	85dB or better	DIN AUDIO
8. Emphasis effect	13 (41)	16kHz	$-9^{+1.0}_{-1.5}$dB	reference level: 1kHz

5 IC BLOCK DIAGRAMS

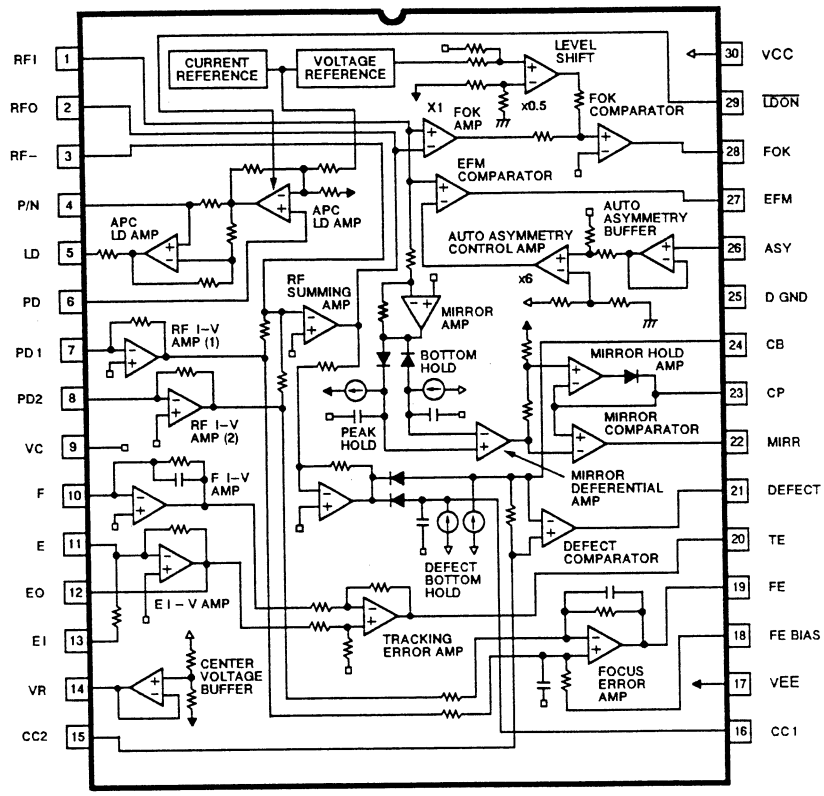
U301 **SAA7350GP**



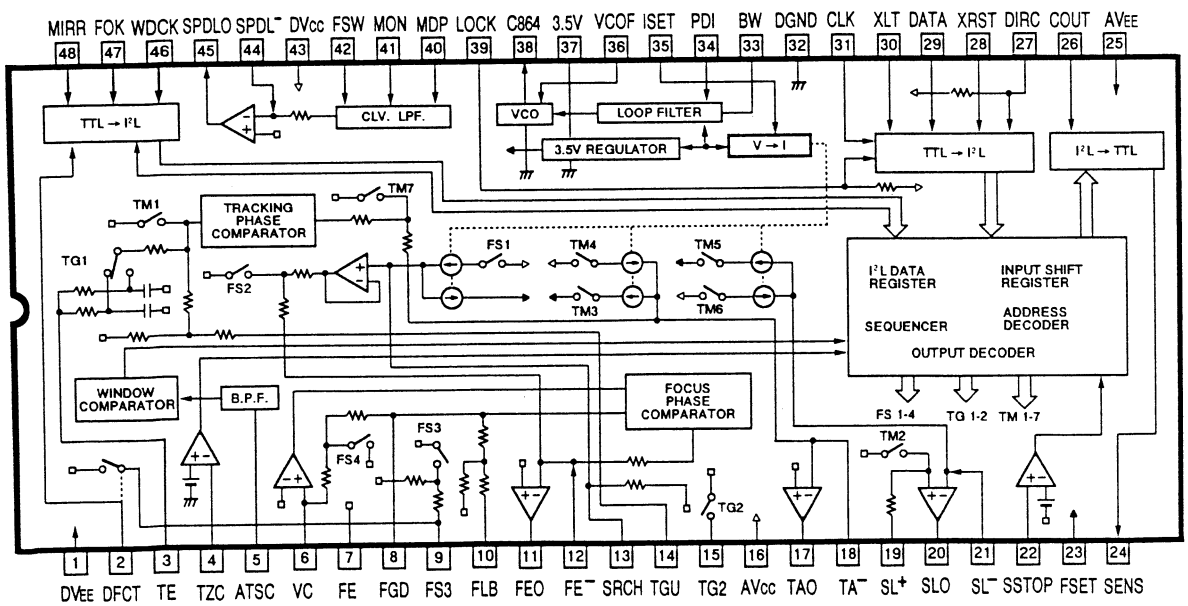
U471 **uPD75208CW**



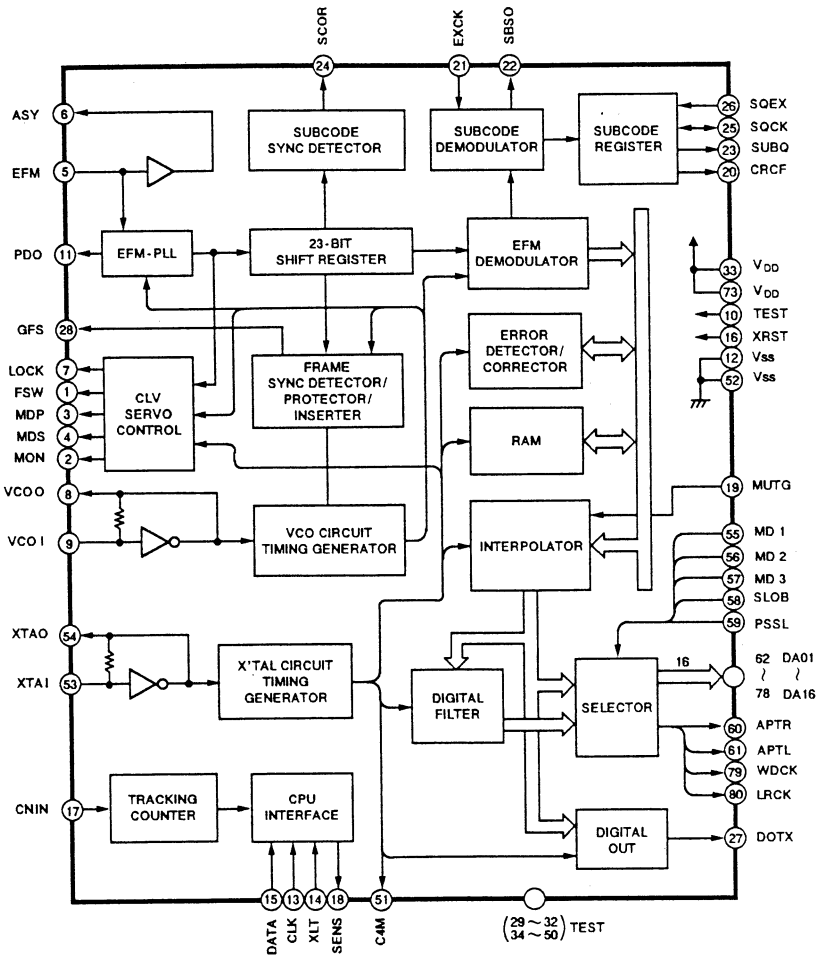
U401 **CXA1081S**



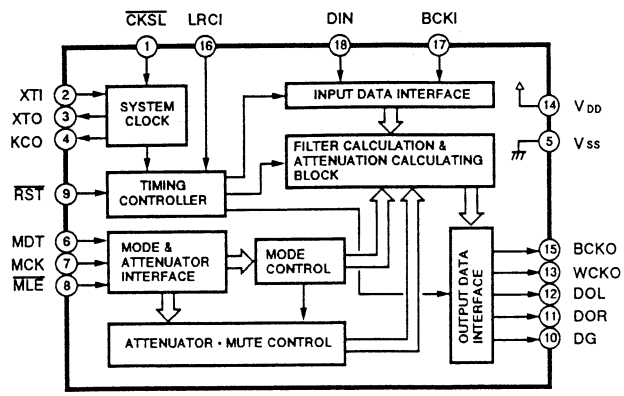
U402 **CXA1082BS**



U404 **CXD1167Q**

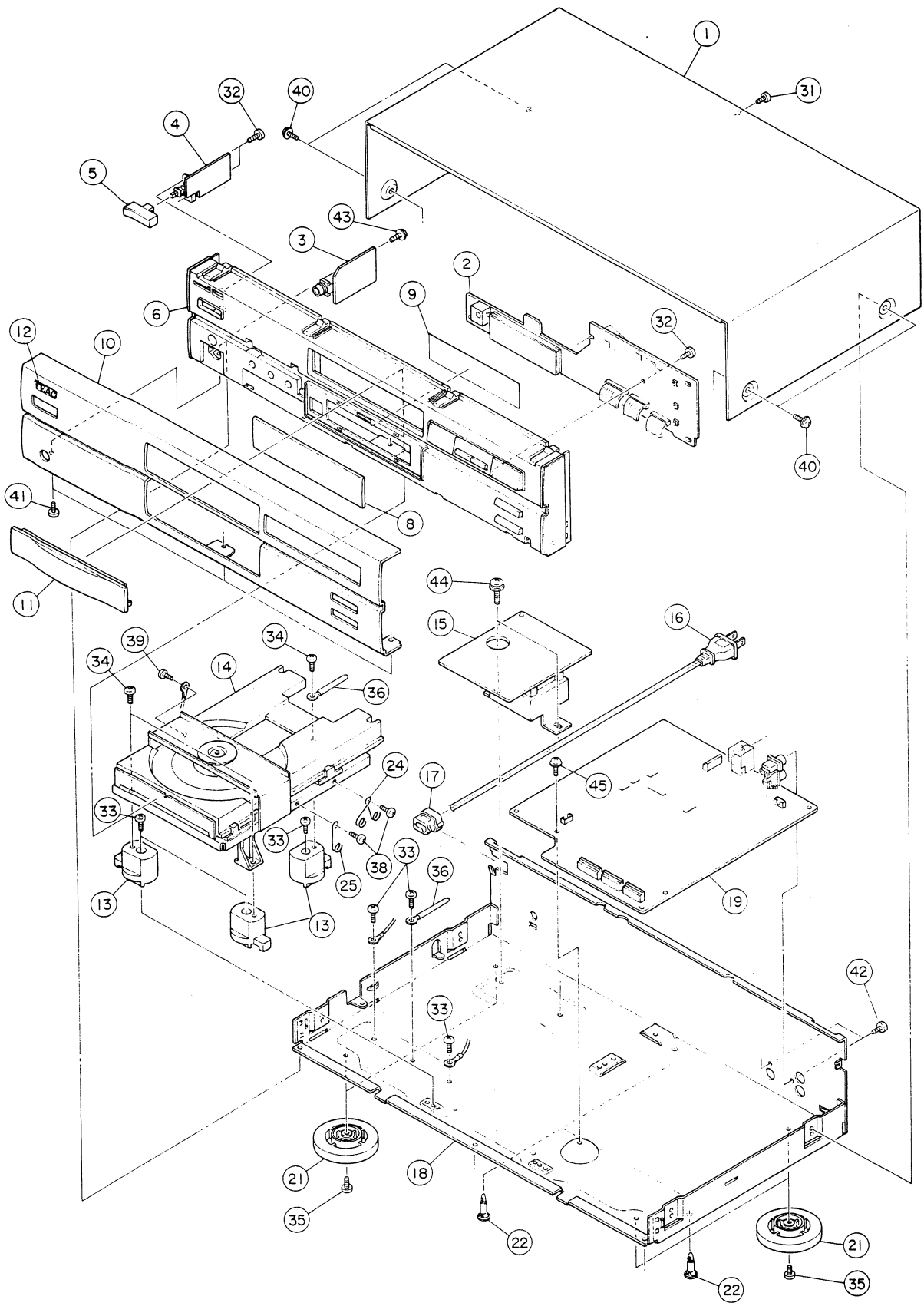


U405 **SM5840AP**



6 EXPLODED VIEWS AND PARTS LIST

EXPLODED VIEW-1



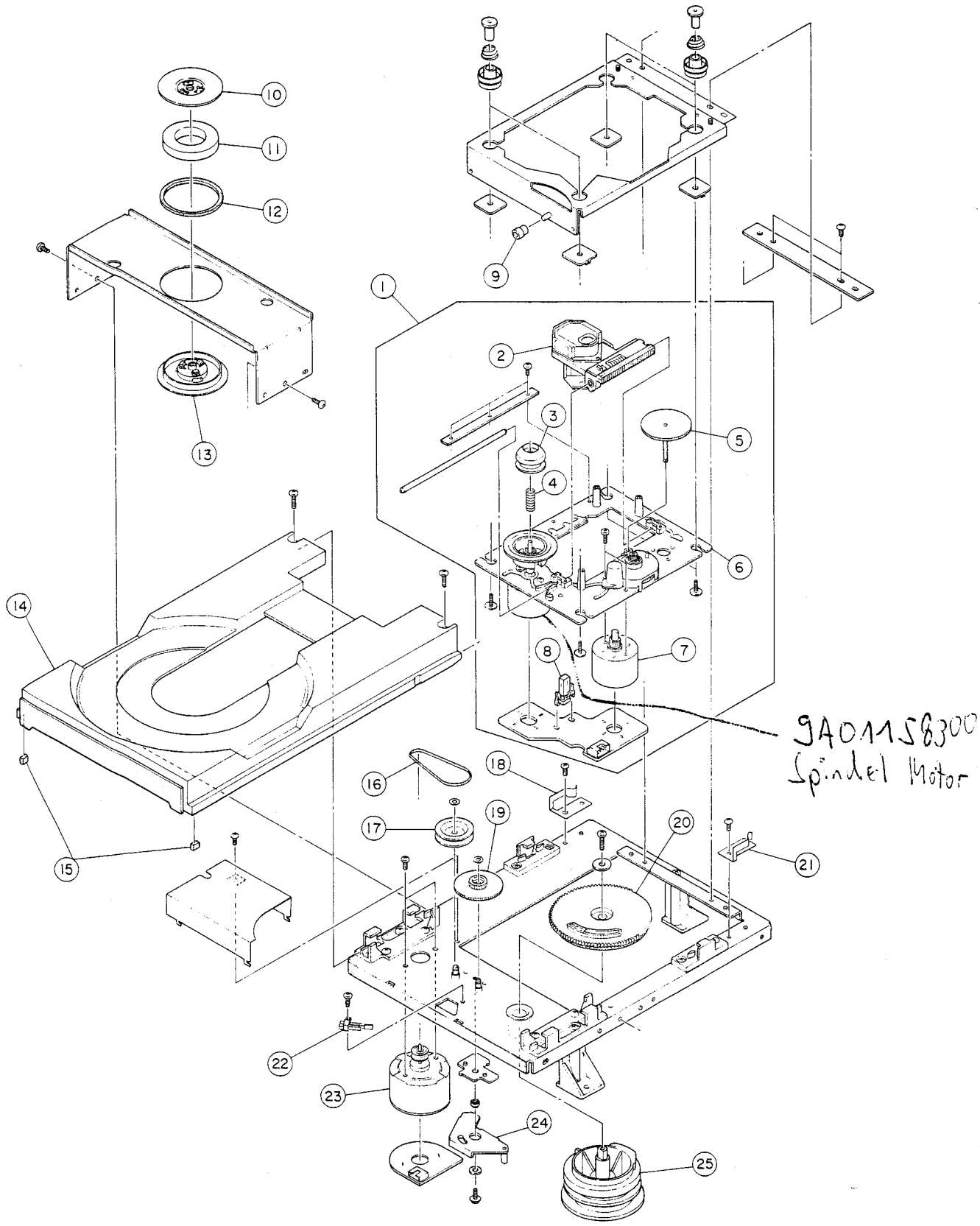
EXPLODED VIEW-1

REF.NO.	PARTS NO.	DESCRIPTION	REMARKS
1- 1	*9260169400	BONNET	
1- 2	*9145079102	KEY PCB ASSY	Refer to pages 18 and 19
1- 3	*9145079700	PHONE PCB ASSY	Refer to pages 18 and 19
1- 4	*9145079200	POWER SW PCB ASSY	Refer to pages 18 and 19
1- 5	*9260132900	POWER BUTTON	
1- 6	*9260162402	ESCUTCHEON FRONT ASSY	
1- 8	*9260160300	WINDOW A	
1- 9	*9260159700	FILTER	
1-10	*9260178600	FRONT PANEL A	
1-11	*9260160000	TRAY PANEL C	
1-12	*5801413200	NAME PLATE, TEAC	
1-13	*9260119802	MECHANISM BASE	
1-14	*9278256400	CD MECH ASSY	Refer to pages 14 and 15
1-15	*9145079800	POWER TRANS PCB ASSY [C]	Refer to pages 18 and 19
	*9145079810	POWER TRANS PCB ASSY [E,UK,A]	Refer to pages 18 and 19
	*9145079820	POWER TRANS PCB ASSY [US,GE]	Refer to pages 18 and 19
1-16	⚠ *9109025800	AC CORD [US,GE]	
	⚠ *9109026000	AC CORD [A]	
	⚠ *9109025701	AC CORD [E]	
	⚠ *9109026200	AC CORD [C]	
	⚠ *9109025901	AC CORD [UK]	
1-17	⚠ *9121000100	BUSHING, #2271 [EXCEPT C]	
	⚠ *9121000101	BUSHING, #2271 [C]	
1-18	----------	MAIN CHASSIS	
1-19	*9145118102	MAIN PCB ASSY	Refer to pages 16 and 17
1-21	9260113901	FOOT ASSY	
1-22	*9260124200	PCB SUPPORT	
1-24	*9260126400	CLAMPER (A)	
1-25	*9260126500	CLAMPER (B)	
1-31	*9783593008	SCREW, C-TITE M3X8 (NI-BLK)	
1-32	*9783603008	SCREW, BTT-P M3X8	
1-33	*9783203006	SCREW, BTT-S M3X6	
1-34	*9783603010	SCREW, BTT-P M3X10	
1-35	*9783203008	SCREW, BTT-S M3X8	
1-36	*9788823059	WIRE CLAMPER	
1-38	*9783102606	SCREW, CAP-S M2.6X6	
1-39	*9783202606	SCREW, BTT-S M2.6X6	
1-40	*9783053006	SCREW, CAP-S M3X6 (BLK)	
1-41	*9783203010	SCREW, BTT-S M3X10	
1-42	*9783613008	SCREW, BTT-P M3X8 (BLK)	
1-43	*9783323010	SCREW, PTB SEMS-F M3X10	
1-44	*9783294008	SCREW, BTB-S M4X8	
1-45	*9783103006	SCREW, CAP-S M3X6	

INCLUDED ACCESSORIES

REF.NO.	PARTS NO.	DESCRIPTION	REMARKS
	*9101394100	OWNER'S MANUAL (M)	
	9109027100	IN-OUTPUT CORD	
	*9151000600	REMOTE CONTROL UNIT, RC-373	
	5347016500	BATTERY, UM-4	

EXPLODED VIEW-2



EXPLODED VIEW-2

REF.NO.	PARTS NO.	DESCRIPTION	REMARKS
2- 1	5761823900	DRIVE UNIT	
2- 2	9278321500	LASER PICK UP, KSS-210A	
2- 3	*9278321400	CENTER RING (LO)	
2- 4	*9278321300	SPRING (S)	
2- 5	9278321600	TOOTH GEAR (A)	
2- 6	9278321700	TT CHASSIS ASSY (MB)	
2- 7	9278321800	MOTOR GEAR ASSY (MR)	
2- 8	9278322000	SW, LEAF	
2- 9	*9278317400	ROLLER (SP)	
2-10	*9278317000	CHUCKING YOKE (SP)	
2-11	*9278316900	MAGNET	
2-12	*9278316800	DAMPER	
2-13	9278316500	CHUCKING PULLEY (AU)	
2-14	*9278316200	TRAY (SP)	
2-15	*9278316300	DAMPER	
2-16	9278318700	LM BELT	
2-17	9278318900	LOADING PULLY	
2-18	*9278319300	TRAY HOLDER (R) SP	
2-19	9278319100	MIDDLE GEAR (SP)	
2-20	9278318500	DRIVE GEAR (SP)	
2-21	*9278319400	TRAY HOLDER (L) SP	
2-22	9278320000	SW, LEAF	
2-23	9278321100	MOTOR ASSY	
2-24	*9278320500	STOPPER LINK ASSY (AU)	
2-25	9278320300	CONTROL CAM (SP)	

5761741400 → 5761823900

7 PC BOARDS AND PARTS LIST

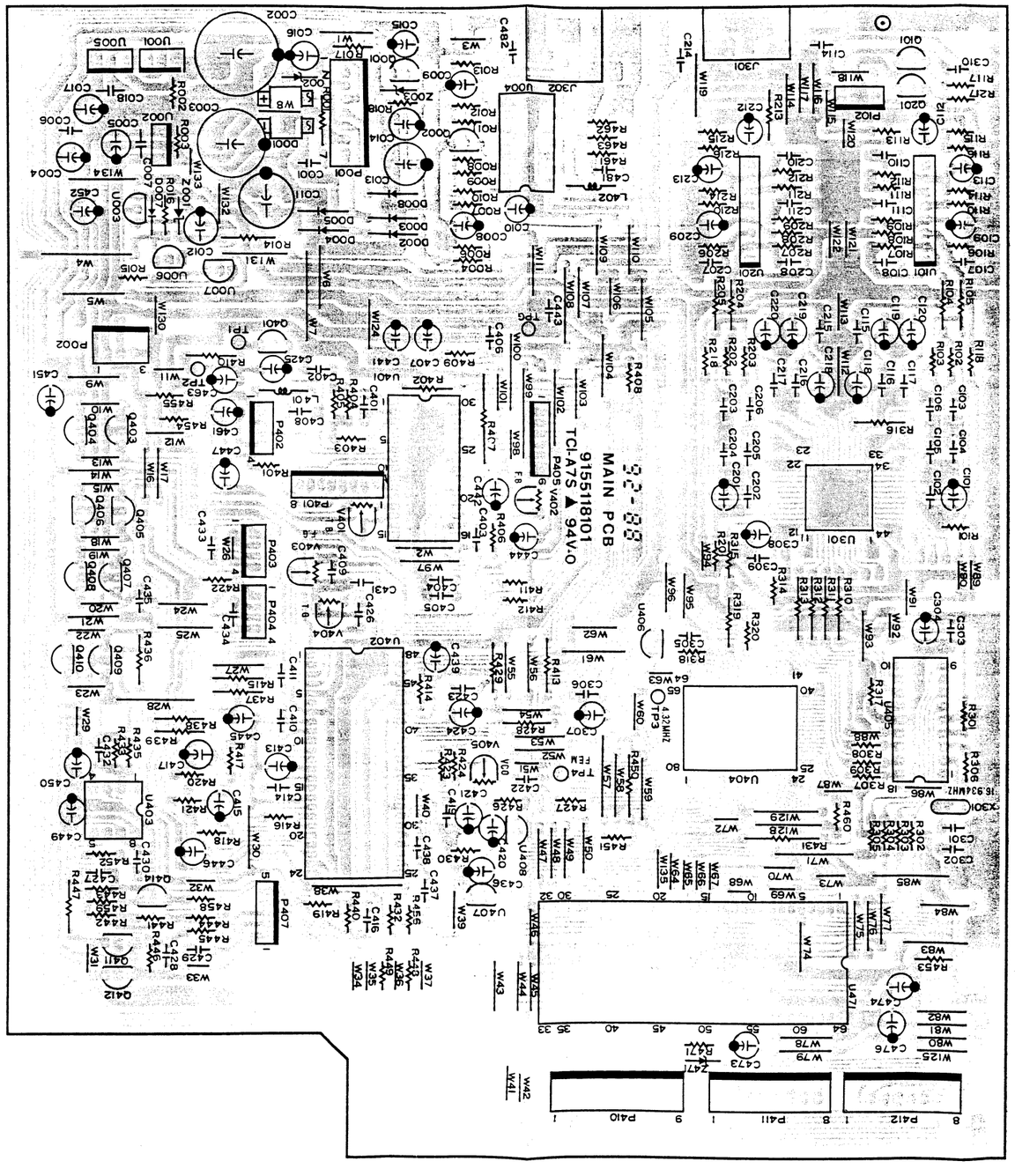
MAIN PCB ASSY

REF.NO.	PARTS NO.	DESCRIPTION
	*9145118102	MAIN PCB ASSY
	*9155118101	MAIN PCB
	*9260124400	EARTH PLATE (B)
C002	⚠ 9117302200	C, ELECT 4700UF/16V
C003	⚠ 9117273500	C, ELECT 2200UF/16V
C011	⚠ 9117258000	C, ELECT 1000UF/16V
D001	⚠ 9165021700	BRIDGE RECTIFIER, PBDF103
D002-005	⚠ 9165020550	DIODE, 1N4003
D007	9165020250	DIODE, 1S1555
D008	9165020550	DIODE, 1N4003
J301	9143280000	PIN JACK, 2P
J302	9143249000	PIN JACK, 1P
L401	9122018810	COIL, 10UH
L402	9122019250	COIL, 4.7UH
P001	9143255000	CONNECTOR PLUG, 7P
P002	9143251000	CONNECTOR PLUG, 3P
P102	9143232000	CONNECTOR PLUG, 4P (WHT)
P401	9143236000	CONNECTOR PLUG, 8P (WHT)
P402	9143232020	CONNECTOR PLUG, 4P (RED)
P403	9143232000	CONNECTOR PLUG, 4P (WHT)
P404	9143232010	CONNECTOR PLUG, 4P (BLK)
P405	9143234000	CONNECTOR PLUG, 6P (WHT)
P407	9143233000	CONNECTOR PLUG, 5P (WHT)
P410	9143257000	CONNECTOR PLUG, 9P
P411,412	9143256000	CONNECTOR PLUG, 8P
Q001	9163202400	TR, 2SB562C
Q002	9163310520	TR, 2SC1740SLN-S
Q101,201	9163310520	TR, 2SC1740SLN-S
Q401	9163202400	TR, 2SB562C
Q403	9163609600	TR, 2SD774K4
Q404	9163202400	TR, 2SB562C
Q405	9163609700	TR, 2SD468C
Q406	9163202400	TR, 2SB562C
Q407	9163609700	TR, 2SD468C
Q408	9163202400	TR, 2SB562C
Q409	9163609700	TR, 2SD468C
Q410	9163202400	TR, 2SB562C
Q411	9163609600	TR, 2SD774K4
Q412	9163202300	TR, 2SB734K4
Q414	9163202400	TR, 2SB562C
TGP	9160012600	PIN T.P
TP 1- 4	9160012600	PIN T.P
U001,005	⚠ 9167014800	IC, NJM7805FA
U002	⚠ 9167014900	IC, NJM7905FA
U003,006	9163011420	TR, DTA114ES
U004	9167014700	IC, UPD74HC04C
U007	9163313220	TR, DTC114ES
U101,201	9167015800	IC, NJM4565L
U301	5220099700	IC, SAA7350GP
U401	5220441400	IC, CXA1081S
U402	5220441500	IC, CXA1082BS
U403	9167015000	IC, M5218AP
U404	5220098100	IC, CXD1167Q
U405	5220099800	IC, SM5840AP
U406-408	9163313220	TR, DTC114ES

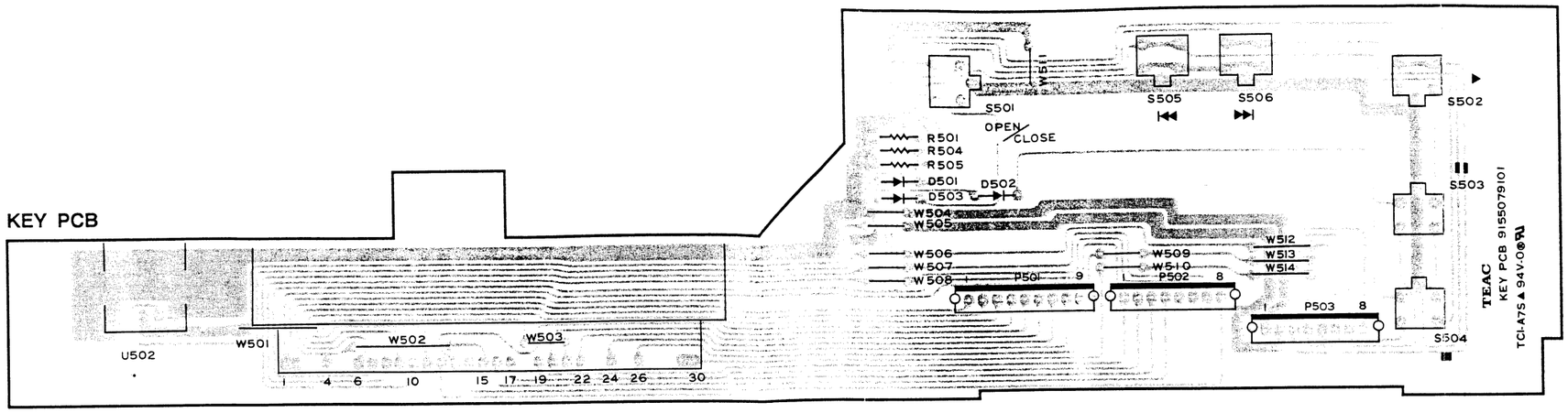
MAIN PCB ASSY

REF.NO.	PARTS NO.	DESCRIPTION
U471	5220829500	IC, UPD75208CW-B43
V401	9112057000	VR, SEMI-FIXED 22K(B)
V402	9112056000	VR, SEMI-FIXED 4.7K(B)
V403,404	9112057000	VR, SEMI-FIXED 22K(B)
V405	9112058000	VR, SEMI-FIXED 1K(B)
X301	5347010900	OSC, CRYSTAL 16.9344MHZ
Z001,002	9166032250	ZENER DIODE, 05AZ6.2X
Z003	9166033852	ZENER DIODE, 05AZ30Z
Z471	9166032650	ZENER DIODE, 05AZ9.1X

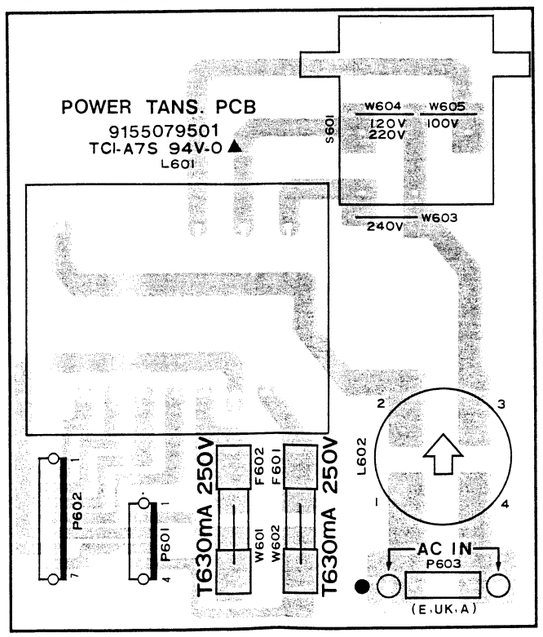
MAIN PCB



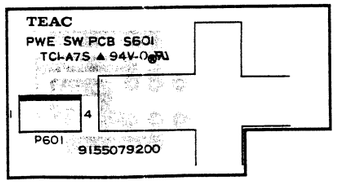
KEY PCB



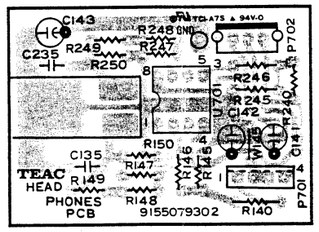
POWER TRANS. PCB



POWER SW PCB



PHONE PCB



KEY PCB ASSY

REF.NO.	PARTS NO.	DESCRIPTION
	*9145079102	KEY PCB ASSY
	*9155079101	KEY PCB
	*9260124301	CUSHION FL
	5292210300	REMOTE CONTROL MODULE
	9143266100	WIRE HOLDER, 8P
	9143267100	WIRE HOLDER, 9P
D501-503	9165020250	DIODE, 1S1555
F501	5347017600	FL DISPLAY, FIPIONM7-A
S501-506	9136000502	SW, TACT

POWER TRANS. PCB ASSY

REF.NO.	PARTS NO.	DESCRIPTION
	*9145079800	POWER TRANS PCB ASSY[C]
	*9145079810	POWER TRANS PCB ASSY[E,UK,A]
	*9145079820	POWER TRANS PCB ASSY[US,GE]
	*9155079501	POWER TRANS PCB
⚠	9125080201	POWER TRANSFORMER [E,UK,A]
⚠	9125080301	POWER TRANSFORMER [US,GE]
⚠	9125080500	POWER TRANSFORMER [C]
⚠	5292806300	NOISE FILTER
	5327009600	TERMINAL LAPPING,2P[E,UK,A]
⚠	5332029900	VOLTAGE SELECTOR [US,GE]
	9143262100	WIRE HOLDER, 4P
	9143265100	WIRE HOLDER, 7P
⚠	5142186000	FUSE, 800MA/250V [E,UK,A]
	9150018000	FUSE HOLDER [E,UK,A]

5332015800 -"-

POWER SW PCB ASSY

REF.NO.	PARTS NO.	DESCRIPTION
	*9145079200	POWER SW PCB ASSY
	*9155079200	POWER SW PCB
⚠	9135031000	SW, POWER
	9143252000	CONNECTOR PLUG, 4P

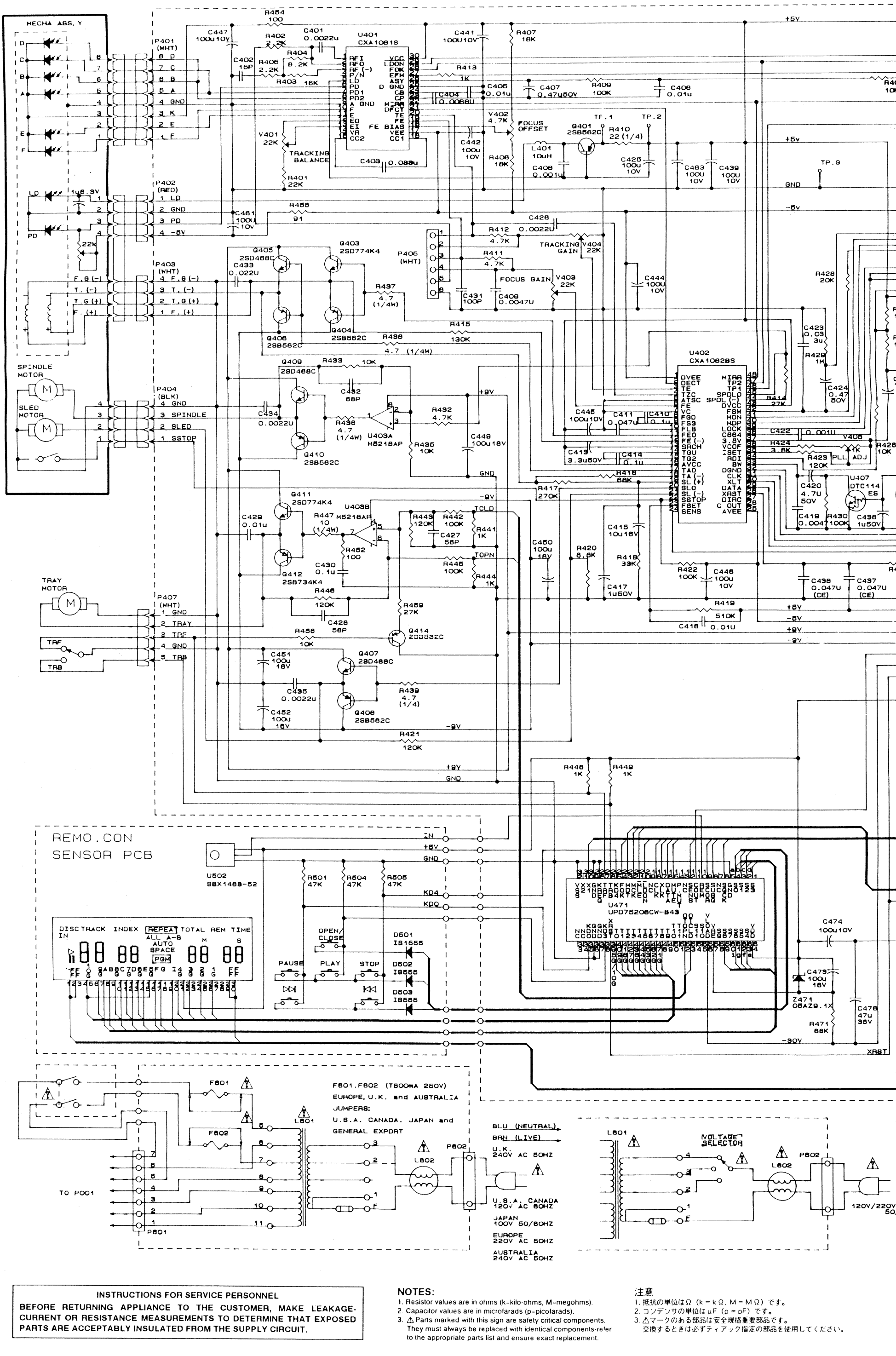
PHONE PCB ASSY

REF.NO.	PARTS NO.	DESCRIPTION
	*9145079700	PHONE PCB ASSY
	*9155079302	PHONE PCB
	9143248000	PHONE JACK
U102	9167015000	IC, M5218AP

NOTES

- PC boards shown are viewed from parts side.
- Parts marked with * require longer delivery time.
- The parts with no reference number or no parts number in the exploded views are not supplied.
- As regards the resistors and capacitors, refer to the circuit diagrams contained in this manual.
- ⚠ Parts marked with this sign are safety critical components. They must be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.
- Parts of [ ] mark can be used only with the version designated. [US]:U.S.A. [C]:CANADA [GE]:GENERAL EXPORT [E]:EUROPE [UK]:U.K. [A]:AUSTRALIA

TEAC SCHEMATIC DIAGRAM CD-P3500



INSTRUCTIONS FOR SERVICE PERSONNEL

BEFORE RETURNING APPLIANCE TO THE CUSTOMER, MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT.

NOTES:

1. Resistor values are in ohms (k=kilo-ohms, M=megohms).
2. Capacitor values are in microfarads (p=picofarads).
3. ⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components-refer to the appropriate parts list and ensure exact replacement.

注意

1. 抵抗の単位はΩ（k＝kΩ, M＝MΩ）です。
2. コンデンサの単位はμF（p＝pF）です。
3. ⚠マークのある部品は安全規格重要部品です。
   交換するときは必ずティアック指定の部品を使用してください。

MAIN PCB

U402 CXA1082BS

U404 CXD1187Q

U471 UPD75208CW-843

U405 SM5840AP

U301 SAA7350GP

U004A uPD74HC04C

U004B

U004C

U004D

U004E

U004F

U407 DTC114ES

U408 DTC114ES

U406 DTC114ES

U007 DTC114ES

U008 DTA114ES

U003 DTA114ES

U102A M5218A

U102B M5218A

U101A NJM4565L

U101B NJM4565L

U201A NJM4565L

U201B NJM4565L

U001 NJM78M05FA

U002 NJM7905FA

U005 NJM78M05

P701

P702

FROM P102

FROM P002

Q001 2SB562C

Q002 2SC1740SLN-S

Z002 05AZ8.2X

Z003 05AZ30Z

Z471 05AZ9.1X

D007 1S1555

D008 1N4003

X301 18.934MHz

L402 4.7uH

L601

L602

P802

VOLTAGE SELECTOR

120V/220V/240V 50/60HZ

注意

1. 抵抗の単位はΩ（k＝kΩ, M＝MΩ）です。
2. コンデンサの単位はμF（p＝pF）です。
3. ⚠マークのある部品は安全規格重要部品です。
交換するときは必ずティアック指定の部品を使用してください。

MAIN PCB

HEAD PHONE PCB

CD-P3500

Compact Disc Player

1 st Issue; September 1992